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Ultraviolet short pulses from an all-solid-state Ce:LiCAF master-oscillator-power-amplifier system

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Abstract

We have developed an all-solid-state master-oscillator-power-amplifier system employing Ce:LiCAF, a new degradation-free tunable ultraviolet laser medium pumped by the fourth harmonic of conventional 10-ns Q-switched Nd:YAG lasers. The low-Q, short-cavity Ce:LiCAF master oscillator produced a satellite-free 1-ns pulse under appropriate pumping-fluence control. 18% energy extraction with sufficient gain was achieved in a single-stage, confocal, double-pass amplifier. As a result, 289-nm, 1-ns, 14-mJ pulses were efficiently obtained from this simple laser system.